ABSTRACT OF THE DISCLOSURE

An ultrafast time hopping wireless satellite communications system -- which can transmit at light or infrared or millimeter wave or microwave or RF energies -- which uses individual packets or pulses in a sequence of such packets or pulses, those individual packets or pulses being so short in duration, that the individual packet or pulse signal energy is spread over the allowed bandwidth simultaneously or instantaneously (instead of sequentially). A time hopping sequential code is also used to position these packets or pulses precisely in sequence providing optimum use of time-frequency space and also providing noninterfering transmission channels due to the orthogonality of the coding schemes used. The ultrashort nature of the individual packets or pulses used also permits the time duration of a frame to be divided into very many microintervals of time in which the signal could occur. This division into very many microintervals in a frame permits the availability of many possible coding schemes as well as many noninterfering transmission channels. Thus, the ultrashort nature of the individual packets or pulses, together with orthogonal coding schemes, permits the highest multichannel data rates of any wireless communications system. In one embodiment of the present invention, a communications system uses: (i) orthogonal codes which can be slaved to a single receiver/matched filter and which captures and assigns each code to unique decoders; (ii) correlators/acquisition systems/matched filters which are able to detect the ultrafast signals and retain memory of such capture over superframes; (iii) power sources, antennas, encoders, oscillator-clocks, intelligence/data encrypters; and (iv) ASICs to provide coding information to both encoders and decoders.

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